

CORRES. CONTROL
OUTGOING LTR NO.

OE ORDER# 4700.1
94 RF 11630

EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.
ROCKY FLATS PLANT, P.O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000



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November 17, 1994

1150
94-RF-11630

R. R. Sarter
Project Manager
Environmental Restoration
DOE/RFFO

TRANSMITTAL OF OPERABLE UNIT (OU) 9 TECHNICAL MEMORANDUM NO. 1, VOLUME 1, DRAFT FINAL MODIFICATION FOR TANK SITES T-11 AND T-30 - CDC-017-94

Action: Review response to comments and transmit modification to regulatory agencies.

Enclosed, please find seven copies of the OU 9 Technical Memorandum No. 1, Volume 1, Draft Final Modification for T-11 and T-30 for transmittal to the Colorado Department of Public Health and the Environment and the Environmental Protection Agency. This is contingent on your acceptance of the response to comments. This revision contains the incorporation of comments from EG&G Rocky Flats, Inc. and the Department of Energy/Rocky Flats Field Office (DOE/RFFO). The response to DOE/RFFO comments is also attached. If this can be turned around quickly, it will allow the investigation of T-11 and T-30 to be incorporated with field efforts on other tanks.

Thank you for your prompt attention to this document and, if you have any questions regarding this Technical Memorandum Modification, please call me on extension 6953 or digital page 5466, or B. D. Peterman at extension 8659 or digital page 5472.

C. D. Cowdery
Project Manager - OU 9
Industrial Area OU Closures/Decontamination & Decommissioning Team

Orig. and 1 cc - R. R. Sarter

CDC:alk

Attachments:
As Stated

CC:
J. R. Burd - Scientific Applications International Corporation w/o Attachments
J. M. Roberson - DOE/RFFO w/o Attachments
S. W. Slaten - " " " "

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November 17, 1994

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R. R. Sarter
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ANIER REVIEW OF TECHNICAL DOCUMENTS

REVIEW COMMENT RECORD

Document Reviewed: OU9 Technical Memorandum 1, Volume I T-11 and T-30			Reviewer: J.R. Burd Signature: Date: Oct. 31, 1994 Phone: x8252 Organization: ER/RFO	Agreement with Dispositions: Date: Reviewer: Document Preparer:
*Comment Type: E = Essential (agreement must be documented for other than verbatim incorporation); S = Suggested; Non-C = Nonconcurrence				
Comment No.	Comment Type*	Para. No.	Comment	Disposition
1	E	Table 1-1	Status given in this table for the T-30 tank should be checked. The current active tanks for which this is secondary containment are not RCRA permitted. They are 90-day storage for which EG&G seems to be prepared to drop from 90-day status.	Status of T-30 was changed to "secondary containment for 90-day storage".
2	E	3.2.6	See comment 1. The active tanks receive plenum deluge not process waste.	Sentence was changed to reflect that the 90-day storage tanks serve as process waste and plenum deluge tanks.
3	E	3.2.6	There is no technical reason to collect a surface soil sample from outside of 731 building. The surface is above the elevation of any possible release to the environment because the tanks were below grade in the 731 building. This building would have to have filled with fluid before a surface release could have occurred. The surface around the building is paved so any surface releases would have been directed to a storm drain. This sample should be deleted unless some regulatory driver exists.	The surface soil sample was not deleted. The surface soil sample can delineate between surface spills and tank releases. If no contamination is found in the surface soil sample, this can be used as confirmation data for closure. Also, the surface soil sample is consistent with both the OU9 TM1, Vol I Outside Tanks and the OU9 RFI/RI Work Plan.

Document Reviewed: OU9 Technical Memorandum 1, Volume I T-11 and T-30				Reviewer: J.R. Burd Signature: Date: Oct. 31, 1994 Phone: x8252 Organization: ER/RFO	Agreement with Dispositions: Date: Reviewer: Document Preparer:
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Comment No.	Comment Type*	Para. No.	Comment	Disposition	
4	S	3.2.6	<p>The 2nd sentence in the last paragraph should be reworded to, "Groundwater samples will also be analyzed for tritium".</p> <p>The 3rd sentence in this paragraph should have "for all samples" inserted after "analysis" if this is true. This sentence should also be specific about which media will be analyzed for special parameters such as groundwater for specific conductivity.</p>	<p>The sentence was changed to "Groundwater samples will also be analyzed for tritium".</p> <p>The sentence was changed to include "for all samples" inserted after "analysis". The phrase "for groundwater samples" was inserted after parameters.</p>	
5	E	App A	<p>2nd column, point 2. - The reference to the surface soil sample should be removed if this sample is deleted.</p> <p>3rd column, point 2. - Will the HPGe survey be conducted on a 4-foot grid? If so will the configuration be modified to eliminate the serious over sampling that will otherwise occur?</p> <p>3rd column, point 4. - This point says that one wipe sample will be collected for the inside of the tank. The text says that a wipe sample will be collected from the sump.</p> <p>3rd column, point 5 - Refer to comments on the surface soil sample. Delete from this point if this sample is not taken.</p>	<p>Sample was not deleted, see response to comment number 3.</p> <p>The 4-foot grid refers to the Nal survey only. The text was changed to "The Nal survey will be conducted using 4-foot grids and will cover the entire area of T-11, T-30 to delineate source."</p> <p>The sentence was changed to "in instances where no residue is present, one wipe sample will be collected from the vault area".</p> <p>Sample was not deleted, see response to comment number 3.</p>	

TABLE 1-1
TANK DESCRIPTIONS
OU9 ORIGINAL PROCESS WASTE LINES

TANK NUMBER	HSS	BUILDING NO.(1)	NUMBER OF TANKS	CONSTRUCTION TYPE(2)	VOLUME (gal)	CONSTRUCTION MATERIAL(3)	TANK STATUS(4)	YEAR INSTALLED
T-1	NA	122	1	UG	800	SS	Removed (Jan 1984)	1955
T-2	122	441	1	UG	3,000	Conc	Abandoned (June 1982)	1952
T-3	122	441 (429)	2	1 - UG, 1 - AG1	UG - 3,000, AG - 3,200	UG - Conc, AG - Sil	Abandoned (June 1982)	1952
T-4	NA	447	3	FS	60 ea	Conc	Active(a)	1962
T-5	NA	444	2	AG1	4,000 ea	Sil	Active(b)	1952
T-6	NA	444	2	FS	500 & 300	Conc	Active(c)	1952
T-7	159	559 (528)	2	AG2	2,000 ea	Sil	Currently inactive (90-day)*	1969
T-8	126	771 (728)	2	UG	25,000 ea	Conc	Plenum deluge(d)	1952
T-9	132	776 (730)	2	UG	22,500 ea	Conc	Plenum deluge(d)	1955
T-10	132	776 (730)	2	UG	4,500 ea	Conc	Abandoned (Dec 1982)	1955
T-11	NA	707 (731)	2	UG	2,000 ea	Conc	Abandoned part removed 1975	1959
T-12	NA	N/A	N/A	N/A	N/A	N/A	Invalid tank location	N/A
T-13	215	774	1	SU	600	Conc	Abandoned (1972)	1952
T-14	124	774	1	UG	30,000	Conc	Abandoned (1989)	1952
T-15	146	774	2	UG	7,500 ea	Conc	Removed (1972)	1969
T-16	124,125	774	2	UG	14,000 ea	Conc	Abandoned (1989)	1952
T-17	146	774	4	UG	2-3,750; 2-7,500	Conc	Removed (1972)	1969
T-18	NA	778	1	SU	Unknown	Conc	Abandoned (1982?)	Unk.
T-19	NA	779	2	SU	1,000 ea	Conc	Plenum deluge(d)	1964
T-20	NA	779	2	SU	8,000 ea	Conc	Abandoned (Dec 1982)	1964
T-21	NA	886 (828)	1	FS	135	Conc	Abandoned (1978)	1963
T-22	NA	886 (828)	3	AG2	2-450, 1-100	SS	Abandoned (1978)	1963
T-23	NA	865	1	SU	6,000	Conc	Abandoned (May 1982)	1979
T-24	NA	881 (887)	7	AG2	2,700 ea	Sil	Active(e)	1952
T-25	NA	883	2	AG1	750 ea	Sil	Active(f)	1952
T-26	NA	883	3	AG1	750 ea	Sil	Active(g)	1965
T-27	NA	886	1	AG1	500	Sil	Removed (July 1989)	Unk.
T-28	NA	889	2	FS	1,000	Conc	Active(h)	1965
T-29	NA	774	1	OG	200,000	Sil	Abandoned (1985)	1952
T-30	NA	707 (731)	1	SU	23,111	Conc	Secondary containment for 90 day storage	1959

TABLE 1-1
TANK DESCRIPTIONS
OU9 ORIGINAL PROCESS WASTE LINES

TANK NUMBER	HSS	BUILDING NO.(1)	NUMBER OF TANKS	CONSTRUCTION TYPE(2)	VOLUME (gal)	CONSTRUCTION MATERIAL(3)	TANK STATUS(4)	YEAR INSTALLED
T-31	NA	N/A	N/A	N/A	N/A	N/A	Invalid tank location	N/A
T-32	NA	881 (887)	1	SU	131,160	Conc	Active(e)	1952
T-33	NA	N/A	N/A	N/A	N/A	N/A	Invalid tank location	N/A
T-34	NA	N/A	N/A	N/A	N/A	N/A	Invalid tank location	N/A
T-35	NA	N/A	N/A	N/A	N/A	N/A	Invalid tank location	N/A
T-36	NA	771C	1	SU	500	Stl	Abandoned (1984?)	1965
T-37	NA	771C	1	SU	500	Conc	Abandoned (1984?)	Unk.
T-38	NA	779	1	AG2	1,000	Stl	Active(c)	Unk.
T-39	NA	881	4	AG1	250 ea	Stl	Removed (1975)	1952
T-40	NA	889	2	UG	400 ea	Conc	Abandoned (1981/1982)	mid 1950s

Notes:

(1) Building numbers in parentheses are process waste pits adjacent to production buildings.

(2) Tank Types:

FS Floor Sump (used for spill control)
SU Sump (open-top or covered)
UG Underground (sealed, permanently closed top)
AG1 Above-Grade
AG2 Above-Grade in sump
OG On-Grade

(3) Tank Materials:

SS Stainless Steel
Stl Steel
Conc Concrete

(4) Active Tank Categories (as marked):

a Incidental spill control; not RCRA - permitted
b RCRA - interim status process waste tank
c 90-day transuranic waste tank
d Converted to the RFP plenum fire deluge system as a firewater catch tank
e Secondary containment for RCRA - permitted waste tank

N/A = Not Applicable

NO = Number

RCRA = Resource Conservation and Recovery Act

RFP = Rocky Flats Plant

*Currently inactive and undergoing decontamination for subsequent reuse. Investigation of actively used tanks is postponed until the use of tank is discontinued.

TABLE 1-2
OUTSIDE TANK/INDIVIDUAL HAZARDOUS SUBSTANCE SITE NUMBERS AND DESCRIPTIONS
OU9 ORIGINAL PROCESS WASTE LINES

TANK NUMBER	OTHER R/S NOS	EGAG TANK NUMBER	BUILDING NO	NUMBER OF TANKS	CONSTRUCTION TYPE	VOLUME	CONSTRUCTION MATERIAL	WASTE STREAM	TANK STATUS	DATE	AIR EMISSION INVENTORY NO.	RCRA ID NUMBER
T-1	NA	UNKNOWN	122	1	UG	800	STAINLESS	BLDG 122 WASTE	REMOVED	JAN 1984	-	-
T-2	122	UNKNOWN	441	1	UG	3,000	CONCRETE	BLDG 122, 123, 441 WASTE	PART REMOVED	1968	-	-
T-3	122	T-123	441	1	AG	3,200	STEEL	BLDG 122, 123, 441 WASTE	ABANDONED	JUNE 1982	#00076	-
T-7	159	T1-522, T2-523	559(524)	2	UG	3,000	CONCRETE	BLDG 122, 123, 441 WASTE	ABANDONED	JUNE 1982	#00077	-
T-8	126	T6 EAST, T6 WEST	771(1724)	2	AG on pump	2,000	STEEL	BLDG 559 WASTE	INACTIVE (90 DAY)	-	-	1
T-9	132	730 TANKS	776(730)	2	UG	25,000	CONCRETE	771 WASTE AND 771 PLENUM DELUGE	CONVERTED TO PLENUM DELUGE	MAY 1984	T1-#00282, T2-#00293	-
T-10	132	730 TANKS	776(730)	2	UG	22,500	CONCRETE	LAUNDRY WATER FROM BLDG 776	CONVERTED TO PLENUM DELUGE	OCT 1984	00000	-
T-11	NA	EAST & WEST PROCESS WASTE TANKS	701(731)	2	UG	4,500	CONCRETE	LAUNDRY WATER FROM BLDG 776	ABANDONED	DEC 1982	00002	-
T-20	NA	731 STRUCTURE	731	1	SUMP	23,111	CONCRETE	BLDG 707	PART REMOVED	1975	-	-
T-14	124	T-66	774	1	UG	30,000	CONCRETE	BLDG 707	ACTIVE SPILL CONTROL	-	-	CONTAMINANT REF #2011
T-16	124, 125	T-66, T-67	774	2	UG	14,000	CONCRETE	BLDG 774 HIGH-NITRATE WASTE	ABANDONED	NOV 1989	#144, NOT-1167	#55 18
T-15	146	T-34E, T34W	774	2	UG	7,500	CONCRETE	BLDG 774 HIGH-NITRATE WASTE	ABANDONED	NOV 1988	00182	T66-#55 14, 187-#55 15
T-17	146	T-30, T-33	774	2	UG	3,750	CONCRETE	BLDG 774 TREATED AQUEOUS WASTE	REMOVED	1972	00183	-
T-21	NA	BLDG 641 FLOOR SUMP	866(828)	1	FS	250	CONCRETE	BLDG 774 TREATED AQUEOUS WASTE	REMOVED	1972	-	-
T-22	NA	TANKS 440, 448	866(828)	2	AG	450	STAINLESS	BLDG 774 TREATED AQUEOUS WASTE	REMOVED	1972	-	-
T-27	NA	PORTABLE LIQUID DUMPS	866(828)	1	AG	100	STAINLESS	BLDG 774 TREATED AQUEOUS WASTE	REMOVED	1976	#00039, #000294	-
T-24	NA	T-183, 184, 185, 802A, 802B, 802C, 802D	801(887)	7	AG	2,700	STEEL	INCIDENTAL OVERFLOW FROM T-22	ABANDONED	1978	-	-
T-32	NA	BLDG 881 PROCESS WASTE PIT	881(887)	1	SUMP	131,160	CONCRETE	T-440 AND T-449 - BUILDING 886 ROOMS 101 AND 103 WASTE AND FISSILE URANIUM	ABANDONED	1978	-	-
T-29	NA	T-207	SOUTH 774	1	ON-GRADE	200,000	STEEL	PLUTONIUM	REMOVED	1985	#00186, NOT-1184	#40
T-40	NA	UNKNOWN	NORTH 649	2	UG	400	CONCRETE	FROM T-22, BLDG 886	REMOVED	JULY 1988	-	-
								BLDG 881 WASTE	ACTIVE/RCRA	-	-	#40 30-40 36
								BLDG 881 WASTE	ACTIVE/INCIDENTAL SPILL CONTROL	-	-	SCR #2014
								UNTREATED 774 WASTE	ABANDONED	1985	-	-
								BLDG 889 WASTES	ABANDONED	1987/1982	-	-

NOTES:
AG = aboveground
Bldg. = Building
gal = gallons
ID = Identification
NOS = Numbers
RCRA = Resources Conservation and Recovery Act
UG = underground
FS = Floor Sump
• = currently inactive and undergoing 90-day closure for subsequent reuse
Investigation of actively used tanks will be postponed until use of tanks is discontinued.

EG&G ROCKY FLATS PLANT
Operable Unit 9
Technical Memorandum No.1
Volume I, Part A

Manual: RFP/ER-TM1-93-OU9.2
Section: 1.0 REV. 0
Page: 7 of 12
Organization: Environmental Management

Memorandum is Volume I, Part A - Outside Tanks. Part B (Inside Tanks) and Volume II (Pipelines) are planned to be submitted at a later date.

At this time, a document/drawing search of the OPWL pipelines is proceeding concurrently with the outside building tank investigations. This search includes acquiring engineering drawings and information to supplement knowledge of pipeline locations, structural features, and releases to better define initial sampling locations. Because the majority of valve vaults are associated with the pipelines and further information is being collected on the pipelines including structural features such as valve vaults, valve vaults associated with pipelines will be addressed in Volume II of this Technical Memorandum, which will be submitted at a later date. However, any valve vault that is associated with an OPWL tank (e.g., Tank T-3) will be investigated under this volume of the Technical Memorandum for tanks outside buildings or under Volume I, Part B, for tanks inside buildings.

The outside tanks in the OPWL are generally tanks in open areas of the Industrial Area (IA) at RFP and are either outside or are within small buildings (vaults or waste pits) that only enclose the tank. There are 20 outside tank locations. The tank numbers and descriptions for outside tanks are listed in Table 1-2. Potential overlap of these tanks with other OUs or Individual Hazardous Substance Sites (IHSSs) is shown in Table 1-3.

Some of these tanks are actively used at the Plant and, therefore, are not included for investigation under this Technical Memorandum. These include Tanks T-8, T-9, T-24, and T-32. Investigation of these tanks will be deferred until they become inactive; however, the possibility of initiating investigations before they are inactivated will be further evaluated.

The tank investigations comprise two stages. Stage 1 is designed to locate areas of contamination within the OU9 vadose zone soils and to assess the nature of contamination

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TABLE 1-3 (Continued)
 POTENTIAL OPWL INTERACTIONS WITH OTHER RFP OPERABLE UNITS

TANK	POTENTIAL INTERACTION WITH OTHER OUs
T-9, T-10 (cont.)	IHSS 118.1 (Multiple Solvent Spills West of Building 730), OU8, is located immediately west of the building which houses T-9 and T-10. 118.1 is the former location of an underground carbon tetrachloride storage tank which may have leaked during its operating history. The tank was removed in 1981. The IAG specifies a soil gas survey of 118.1, with soil borings where the survey detects contamination.
T-11, T-30	None
T-14, T-16	T-14 and T-16 consist of three inactive process waste tanks (designated T66, T67, and T68) located on the east side of Building 774. Two other IHSSs also address these tanks. IHSS 124 (Radioactive Liquid Waste Storage Tanks), is comprised of three subparts (124.1, 124.2, and 124.3) which target T66, T67, and T68, respectively. IHSS 125 (Holding Tank), also targets tank T66. IHSSs 124 and 125 have incorporated in to OU9 from OU8.
T-21, T-22	IHSS 164.2 (Building 886 Radioactive Spills) that has been incorporated from OU14, targets uranium contamination in soil around and beneath Building 886. 164.2 appears on location maps to focus on the eastern side of 886, whereas T-21 and T-22 are immediately west of 886. The IAG specifies a surface radiation survey and analysis of soil boring samples for HSL volatiles, HSL semi-volatiles and various radionuclides at 164.2.
T-24, T-32	T-24 and T-32 are possibly affected by IHSSs 106 (Outfall) and 107 (Hillside Oil Leak), OU1. Numerous monitoring wells and boreholes have been completed in the vicinity of T-24 and T-32 in conjunction with the 881 Hillside RI. T-24 and T-32 are active, permitted RCRA waste units.
T-27	T-27 is immediately adjacent to T-21 and T-22; see T-21, T-22 comments.
T-29	Chromate contamination related to IHSS 137 (Cooling Tower Blowdown, Building 774), OU8 may affect soils on the northwest side of T-29.
T-40	IHSS 164.3 (Building 880 Storage Pad), OU14 targets TCL volatiles, TCL semivolatiles, and various radionuclides.

Notes:

(1) If no residue is present, a wipe sample will be collected. Wipe samples will be analyzed only for qualitative toxicological analysis.

(2) Sample collected only if value is not numbered.

Ifs present, a wipe sample will be collected. Wipe samples will be analyzed only for Qualitative. If detected only if water is encountered

Herbs = Herbicides
HPGs = High purity Germanium
HSES = Individual Hazardous Substance Site
NA = Not applicable
Nel = Sodium Ionless, conducted only if HPGs data indicate anomalies
No = Number
OCs = Polychlorinated biphenyls
Perf = Pericides
Rad = Qualitative radiological analysis
RF = Rocky Flats Method
TBD = to be determined in the field based on HPGs results
Vols = Volatiles
WQ = pH, specific conductivity, selected anions: free nitrate, sulfate (NO₃SO₄), total organic carbon (only for water samples)
X = anomalies to be noted

EG&G ROCKY FLATS PLANT
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3.2.6 Tanks T-11 and T-30

Tanks T-11 and T-30 are located in Building 731 (the Building 707 Process Waste Pit). Tank T-11 consists of two 2,000 gallon, concrete tanks that were situated inside the Building 731 structure. Tank T-30 is one 23,111 gallon underground concrete structure (Building 731) and a 100 gallon concrete sump. In 1975, the concrete tanks were partially removed. The concrete wall that separated the two tanks was removed along with part of the concrete tank surface. New concrete was poured into the old process waste tanks and the 100 gallon sump. Currently, the area of the old process waste tanks serves as a secondary containment for the Building 707 process waste and plenum deluge tanks. The process waste and plenum deluge tanks are currently 90 day storage. Waste streams for Tanks T-11 and T-30 are from Building 707. These wastes include solvents, radionuclides, metals and other wastes used at RFP.

According to Building 707 personnel, there is a 100 gallon steel tank filled with Raschig Rings located in Building 731. This tank was used to contain fire deluge from Building 707. If the tank did overflow, it overflowed into the concrete process waste tanks. The piping that connected to the 100 gallon steel tank was disconnected in 1975. This tank did not contain process waste.

Stage 1 activities will include an HPGe Radiological Survey. If the results of the HPGe Survey detect anomalies, then an NaI Radiological Survey will be conducted on 4-foot grids.

A total of four soil boreholes will be drilled. One borehole at each accessible side of the concrete vault (T-30), containing the T-11 tanks. Three soil samples from each borehole will be collected at the following locations: Surface sample (0 to 6 inches), 1 foot below the base of the tanks (estimated at 13 to 15 feet below ground surface), and directly above the water table (estimated at 10 to 12 feet below ground surface).




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If groundwater is encountered in the boreholes, a HydroPunch® sampler or equivalent will be used to collect a groundwater sample. One residue sample will be collected from each tank. If no residue is present, then 1 wipe sample will be taken from the vault area for radiological analysis. Sample locations are provided in Figure 3-4a.

Soil, groundwater, and residue samples will be analyzed for radiological analyses that include gross alpha, gross beta, uranium 233, 234, 235, and 238, americium 241, and plutonium 239 and 240. Groundwater samples will also be analyzed for Tritium. Chemical analyses for all samples include TAL metals, TCL volatiles, TCL semi-volatiles, and water quality parameters for groundwater samples include pH, specific conductivity, nitrate/nitrite, sulfate, chloride, fluoride, and TOC. Wipe samples will be analyzed for quantitative radionuclides. In the event that the water table yields insufficient quantities of groundwater, samples will be collected based on the following priority. TCL volatiles, radionuclides, water quality parameters, TCL semi-volatiles, and metals.

U.S. Department of Energy
 Rocky Flats Plant

-  Buildings
-  Tanks
-  Process Waste Lines

<u>ACTIVITY</u>	<u>NUMBER</u>
 Borehole	4
- Residual	3
 Hydropunch	4
× HPGe	5

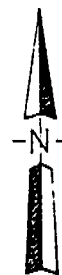



FIGURE 3-4a
 SAMPLE LOCATIONS
 FOR T-11 AND T-30
 Operable Unit 9
 Original Process Waste Lines

 EG&G ROCKY FLATS
 Rocky Flats Plant
 P.O. Box 464
 Golden, Colorado 80402-0464

SCALE: 1"=7'-6"

EG&G ROCKY FLATS PLANT
Operable Unit 9
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3.2.9 Tanks T-21 and T-22

Tanks T-21 and T-22 are located in Building 828 (the Building 886 process waste pit). There is a discrepancy in the information obtained on what tanks are located in the waste pit. According to as-built drawing 14830-4 from 1965. The tank vault consists of a 135 gallon floor sump, one 450 gallon waste holding tank, one 450 gallon process tank and one 100 gallon process tank. According to building personnel the tank vault consists of a 250 gallon floor sump, one 250 gallon process waste tank and one 250 gallon process tank. This information will be clarified when the tank investigation occurs under stage 1 activities. Tanks T-21 and T-22 held waste from the laboratories in Building 886. Waste streams included radionuclides, laboratory soaps, janitorial cleaning fluids, and possibly nitrates, Tank -21, the floor sump, collected overflow from Tank T-22 and groundwater infiltrating the tank vault. The tanks were abandoned in 1978. There are no known releases at this location.

Stage 1 activities will include a visual tank inspection of the tanks. An HPGe radiological survey will be conducted around the tank locations. If the results of the HPGe detect anomalies, a NaI radiological survey will be conducted on 4-foot grids.

One residue sample will be collected from each tank and from the sump. If no residue is present, one wipe sample will be taken from the interiors of the tanks and sumps for radiological analysis. If groundwater has filled the pit or tanks, a water sample will be collected. (Reference Appendix B for access ports for residue sampling.)

A total of four soil boreholes will be drilled: one borehole at each accessible side of the concrete vault containing Tanks T-21 and T-22. Three soil samples from each borehole will be collected at the following locations: ground surface (before drilling), 1 foot below the base of the tanks (estimated at 20 to 25 feet below ground surface), and directly above the water table (estimated at 15 to 20 feet below ground surface).

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If groundwater is encountered in the boreholes, a HydroPunch® sampler or equivalent will be used to collect a groundwater sample. Sample locations are shown in Figure 3-6.

Vault water, soil, and residue samples will be analyzed for radiological analyses that include gross alpha; gross beta; uranium 233, 234, 235, and 238; americium 241; plutonium 239 and 240; and cesium 137. Chemical analyses include TAL metals; TCL volatiles; TCL semivolatiles; and water quality parameters that include pH, specific conductivity, nitrate/nitrite, sulfate, chloride, fluoride, and TOC. Wipe samples, if collected, will be analyzed for quantitative radionuclides. In the event that the water table yields insufficient quantities of groundwater, samples will be collected based on the following priority: TCL volatiles, radionuclides, water quality parameters, TCL semivolatiles, and metals.

APPENDIX A
INVESTIGATION REQUIREMENTS AND PROPOSED ACTIONS
TANKS T-11, T-30
BUILDING 707 PROCESS WASTE PIT

INTER-AGENCY AGREEMENT REQUIRED ACTION	OU9 WORK PLAN REQUIRED ACTION	OU9 PROPOSED ACTION FOR STAGE I
No Required Action	<ol style="list-style-type: none"> 1. Conduct a prework radiation survey of borehole locations according to OP FO.16, Field Radiological Measurements. 2. Boreholes will be drilled and sampled according to OP GT.02, Drilling and Sampling Using Hollow-stem Auger Techniques, using the continuous core method. Investigation of removed tanks will consist of a single borehole drilled as closely as possible to the center of the original tank location. One discrete soil sample will be collected at each of the following locations: (a) ground surface (before drilling) collected according to OP GT.08, Surface Soil Sampling; (b) 1 to 3 feet below the base of the original tank; (c) directly above the water table or bedrock/alluvium contact, whichever is encountered first; and (d) in bedrock at the bedrock/alluvium contact if groundwater is not encountered above the contact (i.e., where the vadose zone extends to the bedrock/alluvium contact). 	<ol style="list-style-type: none"> 1. Conduct a visual tank inspection. 2. Conduct an HPGe survey of the area to assess radioactive contamination. If radioactive anomalies are found, a NaI radiation survey will be conducted. The NaI survey will be conducted using 4-foot grids and will cover the entire area of T-11, T-30 to delineate source. 3. Conduct a prework radiation survey of all sample locations to assess radioactive contamination. Survey will be conducted using the NaI instrument, and in accordance with OP FO.16, Field Radiological Measurements. 4. One residue sample will be collected from each tank that has not been cleaned and painted since removal from process waste service, to help characterize OPWL wastes. In instances where no residue is present, one wipe sample will be collected from the vault area. Wipe samples will be collected and tested according to OP FO.16, Field Radiological Measurements. 5. Four boreholes will be drilled; one on each side of the tanks. The boreholes will be drilled and sampled according to OP GT.02, Drilling and Sampling Using Hollow-stem Auger Techniques, using the continuous core method. In all cases, boreholes will be drilled as close as possible to the tank structure. One discrete soil sample will be collected at each of the following locations: (a) ground

APPENDIX A
INVESTIGATION REQUIREMENTS AND PROPOSED ACTIONS
TANKS T-11, T-30
BUILDING 707 PROCESS WASTE PIT

INTER-AGENCY AGREEMENT REQUIRED ACTION	OU9 WORK PLAN REQUIRED ACTION	OU9 PROPOSED ACTION FOR STAGE I
<p>Notes:</p> <ul style="list-style-type: none"> - high purity germanium - sodium iodide - EMID Operating Procedure - Original Process Waste Lines - Operable Unit - Rocky Flats Plant 		<p>surface (before drilling) collected according to OP GT-08, Surface Soil Sampling; (b) 1 to 3 feet below the base of the water table is not encountered and the distance from the base of the tank to the alluvium/bedrock contact is less than 5 feet, this sample will be omitted; (c) directly above the water table or bedrock/alluvium contact, whichever is encountered first; and (d) 1 foot below the bedrock/alluvium contact or at refusal if bedrock is encountered before the water table.</p> <p>6. If groundwater is encountered during borehole drilling, a HydroPunch® will be used to collect groundwater samples according to OP GW-06, Groundwater Sampling.</p>

APPENDIX A
INVESTIGATION REQUIREMENTS AND PROPOSED ACTIONS
TANK T-40
BUILDING 889 PROCESS WASTE PIT

INTER-AGENCY AGREEMENT REQUIRED ACTION	OU9 WORK PLAN REQUIRED ACTION	OU9 PROPOSED ACTION FOR STAGE I
No Required Action	Not previously identified.	<ol style="list-style-type: none"> 1. Conduct a visual tank inspection. 2. Conduct an HPGe survey of the area to assess radioactive contamination. If radioactive anomalies are found, a NaI radiation survey will be conducted. The NaI survey will be conducted using 4-foot grids and will cover the entire area of T-40 to delineate source. 3. Conduct a prework radiation survey of all sample locations to assess radioactive contamination. Survey will be conducted using the NaI instrument, and in accordance with OP FO.16, Field Radiological Measurements. 4. One residue sample will be collected from each tank that has not been cleaned and painted since removal from process waste service, to help characterize OPWL wastes. In instances where no residue is present, one wipe sample will be collected from the interior surface of the tank. Wipe samples will be collected and tested according to OP FO.16, Field Radiological Measurements. 5. One water sample will be collected from the concrete vault if water is present. 6. Four boreholes will be drilled; one on each side of the tanks. The boreholes will be drilled and sampled according to OP GT.02, Drilling and Sampling Using Hollow-stem Auger Techniques, using the continuous core method. In all cases, boreholes will be drilled as close as possible to the tank structure. One discrete soil sample will be collected at each of the following locations: (a) ground

APPENDIX A
INVESTIGATION REQUIREMENTS AND PROPOSED ACTIONS
TANK T-40
BUILDING 889 PROCESS WASTE PIT

INTER-AGENCY AGREEMENT REQUIRED ACTION	OU9 WORK PLAN REQUIRED ACTION	OU9 PROPOSED ACTION FOR STAGE 1
<p> <small>NHCE:</small> <small>HPGe</small> <small>Nal</small> <small>OP</small> <small>OPWL</small> <small>OU</small> <small>RFP</small> </p> <p> = high purity germanium = sodium iodide = EMU Operating Procedure = Original Process Waste Lines = Operable Unit = Rocky Flats Plant </p>		<p>surface (before drilling) collected according to OP GT.08, Surface Soil Sampling; (b) 1 to 3 feet below the base of the below-grade tanks. If the base of the tank is in bedrock or if the water table is not encountered and the distance from the base of the tank to the alluvium/bedrock contact is less than 5 feet, this sample will be omitted; (c) directly above the water table or bedrock/alluvium contact, whichever is encountered first; and (d) 1 foot below the bedrock/alluvium contact or at refusal if bedrock is encountered before the water table.</p> <p>6. If groundwater is encountered during borehole drilling, a HydroPunch® will be used to collect groundwater samples according to OP GW.06, Groundwater Sampling.</p>